

Registration of PA 15 Soybean Germplasm

PA 15 soybean [*Glycine max* (L.) Merr] germplasm line (Reg. no. GP-314, PI 636444) was developed by the USDA-ARS at Beltsville, MD, and released on 1 Nov. 2004. PA 15, a maturity group V line, is intended for use as germplasm in breeding programs to increase the persistence of soybean crop residue and for study of the longevity of crop residues for soil conservation purposes. PA 15 may also be used to study the use of soybean stem fiber for industrial uses.

PA 15 was derived from the cross of PA 4-11b \times BSR 201 and was composited in the F7 generation. PA 4-11b was derived from the four-way cross (Wilson 6 \times Forrest) \times (Perry \times L76-0253) (USDA-ARS Germplasm Resources Information Network; Hartwig and Epps, 1973; Weiss, 1953). L76-0253 is an F₆ segregate of the cross 'Williams' \times PI 229358 (Bernard and Lindahl, 1972). Progeny from this cross were subject to selection for height and large biomass type at State College, PA, in 1982 and 1984 and at Beltsville, MD, in 1983 and 1985. BSR 201 was bred for resistance to brown stem rot disease [caused by *Phialophora gregata* (Allington & Chamberlain) W. Gams] by the USDA-ARS at Ames, IA (Tachibana et al., 1983).

Crop residue is the portion of a crop left in the field after harvest. Crop residues slow soil erosion rates, improve soil quality, and provide an inexpensive and adequate soil conservation practice (McMurtrey et al., 2005; Wu et al., 2004). The Conservation Technology Information Center (CTIC, 2005), sponsored by the USDA National Resources Conservation Service recommends a minimum level of 30% crop residue soil coverage to be considered an adequate soil conservation practice. The coverage should persist and be maintained from harvest until planting in the following spring. Percentage of residue soil coverage was measured by the line point transect method (Morrison et al., 1993) and equates to the proportion of light interception caused by fragments of soybean crop residue on the soil surface. In 5 yr of field tests at Beltsville, MD, PA 15 had an average of 76% soil cover by crop residue at the time of no till planting of the next year's spring crop, compared to 52% for the cultivar Hutcheson (Buss et al., 1988). After mulch tillage in the spring, PA 15 had 53% soil cover by crop residue and Hutcheson had 20% soil cover when averaged over 4 yr. Over a 6-yr period at Beltsville, MD, dry crop residue biomass at harvest averaged 8.60 Mg ha⁻¹ for PA 15 and 7.75 Mg ha⁻¹ for Hutcheson. When crop residue from the November 2002 harvest was allowed to over-winter for 2 yr of fallow, PA 15 had 40% crop residue surface cover compared with 8% for Hutcheson at the April 2004 spring planting. In this test, PA 15 plots averaged 1409 kg ha⁻¹ of dry biomass persisting in April on the soil surface compared with 585 kg ha⁻¹ for Hutcheson. Over 6 yr the average height of PA 15 was 123.3 cm compared with 91.9 cm for Hutcheson.

PA 15 was tested in the Uniform Soybean Tests of the Southern States in maturity group V preliminary test in 1996 at 10 locations (Tyler, 1997). PA 15 had an average seed yield of 2446 kg ha⁻¹ over all locations in these tests compared to 3487 kg ha⁻¹ for Hutcheson. Over all locations, PA 15 had an average height of 121 cm compared with 72 cm for Hutcheson and had a lodging score of 2.9 compared with 2.3 for Hutcheson. Protein concentration of PA 15 seed was 451 g kg⁻¹ on a dry weight basis compared with 415 g kg⁻¹ for Hutcheson. The oil concentration was 195 g kg⁻¹ compared with 211 g kg⁻¹ for Hutcheson. PA 15 had a seed weight of 13.0 g per 100 seeds compared with 14.9 g per 100 seeds for Hutcheson.

PA 15 is a maturity group V line with yellow seeds with dull luster and brown hila, white flowers, gray pubescence, and indeterminate growth. In tests conducted at Stoneville, MS, PA15 was resistant to southern stem canker [caused by *Diaporthe phaseolorum* (Cooke & Ellis) Sacc. var. *meridionalis* F.A. Fern.]. At Jackson, TN, PA 15 had a score of 4.9 for response to soybean cyst nematode (*Heterodera glycines* Ichinohe) race 3, a score of 4.1 for resistance to race 5, and a score of 2.0 for resistance to race 14. Plants scored 1 had 0 to 5 female nematode cysts per root and plants scored 5 had 40 or more female nematode cysts per root, indicating greater susceptibility. PA 15 also had scores of 3.5 and 3.8 for response to *Meloidogyne arenaria* (Neal) Chitwood and *M. incognita* (Kofoid & White) Chitwood nematodes, respectively.

Seed of PA 15 will be maintained by the Sustainable Agricultural Systems Laboratory, Animal and Natural Resources Institute, USDA-ARS, Beltsville, MD. Seed of PA 15 has been deposited in the National Center for Genetic Resources Preservation at Fort Collins, CO, where it is available for research purposes, including development and commercialization of new cultivars. Seed is available in small quantities (300) seeds to breeders and seedsmen on written request to the corresponding author for at least 5 yr. When this germplasm contributes to a new cultivar or breeding line, it is requested that appropriate recognition be given to its source.

T.E. DEVINE* AND J.E. McMURTREY III

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T.E. Devine, USDA/ARS, Sustainable Agricultural Systems Laboratory, Bldg.001; J.E. McMurtrey III, USDA/ARS, Hydrology and Remote Sensing Laboratory, Bldg.007, Animal and Natural Resources Institute, BARC-West, 10300 Baltimore Ave., Beltsville, MD 20705. Registration by CSSA. Accepted 30 Sept. 2003. *Corresponding author (DevineT@ba.ars.usda.gov).

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